a.) Amendment to the Claims:

1. (Currently Amended) An isolated stem cell obtained from adult bone marrow, wherein said stem cell can differentiate into ~~at least two cells~~ more than one cell, one of which is a cardiomyocyte.

Claims 2-5 (Canceled)

6. (Previously Presented) The isolated stem cell according to claim 1, which can also differentiate into at least one of an adipocyte, a skeletal muscle cell, an osteoblast, a vascular endothelial cell, a nervous system cell, and a hepatic cell.

7. (Currently Amended) The isolated stem cell according to claim 1, which is a multipotential stem cell that differentiates ~~onto~~ into any adult tissue cell.

8. (Previously Presented) The isolated stem cell according to claim 1, wherein the stem cell is CD117-positive and CD140-positive.

9. (Previously Presented) The isolated stem cell according to claim 8, wherein the stem cell is further CD34-positive.

10. (Previously Presented) The isolated stem cell according to claim 9, wherein the stem cell is further CD144-positive.

11. (Previously Presented) The isolated stem cell according to claim 9, wherein the stem cell is further CD144-negative.

12. (Previously Presented) The isolated stem cell according to claim 8, wherein the stem cell is further CD34-negative.

13. (Previously Presented) The isolated stem cell according to claim 12, wherein the stem cell is further CD144-positive.

14. (Previously Presented) The isolated stem cell according to claim 12, wherein the stem cell is further CD144-negative.

15. (Previously Presented) The isolated stem cell according to claim 10, wherein the stem cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

16. (Previously Presented) The isolated stem cell according to claim 11, wherein the stem cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

17. (Original) The isolated stem cell according to claim 12, wherein the stem cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

18. (Previously Presented) The isolated stem cell according to claim 13, wherein the stem cell is further CD14-negative, CD45-negative, CD90-negative, Flk-1-negative, CD31-negative, CD105-negative, CD49b-negative, CD49d-negative, CD29-positive, CD54-negative, CD102-negative, CD106-negative, and CD44-positive.

19. (Previously Presented) The isolated stem cell according to claim 1, which does not take up Hoechst 33342.

Claim 20 (Cancelled).

21. (Previously Presented) The isolated stem cell according to claim 1, which differentiates into a ventricular cardiac muscle cell.

22. (Previously Presented) The isolated stem cell according to claim 1, which differentiates into a sinus node cell.

23. (Previously Presented) The isolated stem cell according to any one of claims 1, 6-19, 21 or 22, wherein the bone marrow is mammalian.

24. (Previously Presented) The isolated stem cell according to claim 23, wherein the mammal is selected from the group consisting of a mouse, a rat, a guinea pig, a hamster, a rabbit, a cat, a dog, a sheep, a swine, cattle, a goat and a human.

25. (Previously Presented) The isolated stem cell according to claim 1, which is mouse BMSC (FERM BP-7043).

26. (Previously Presented) The isolated stem cell according to claim 24, which differentiates into a cardiomyocyte by demethylation of a chromosomal DNA of the stem cell.

27. (Previously Presented) The isolated stem cell according to claim 26, wherein demethylation is carried out by administering at least one selected from the group consisting of demethylase, 5-azacytidine, and dimethyl sulfoxide.

28. (Original) The cell according to claim 27, wherein the demethylase comprises the amino acid sequence represented by SEQ ID NO:1.

Claims 29-37 (Cancelled).

38. (Previously Presented) The isolated stem cell according to claim 24, wherein differentiation is inhibited by a fibroblast growth factor-2.

39. (Previously Presented) The isolated stem cell according to claim 38, wherein the FGF-2 comprises the amino acid sequence represented by SEQ ID NOS:7 or 8.

Claim 40 (Cancelled).

41. (Previously Presented) The isolated stem cell according to claim 24, which differentiates into a cardiac muscle by transplantation into a blastocyst or by co-culturing with a cardiomyocyte.

Claim 42 (Cancelled).

43. (Previously Presented) The isolated stem cell according to claim 24, which differentiates into an adipocyte by administering a compound having a thiazolidione skeleton.

44. (Previously Presented) The isolated stem cell according to claim 43, wherein the thiazolidione compound is at least one selected from the group consisting of troglitazone, pioglitazone, and rosiglitazone.

Claims 45-46 (Cancelled).

47. (Previously Presented) A method for differentiating a cell into a cardiac muscle, comprising selecting an isolated stem cell according to claims 1, 6-19 or 21-28 and administering thereto a chromosomal DNA-dimethylating agent.

48. (Previously Presented) A method for redifferentiating the isolated stem cell according to claim 9 into a cell which is CD34-negative, comprising selecting said stem cell and administering thereto a chromosomal DNA-dimethylating agent.

49. (Previously Presented) A method for redifferentiating a cell comprising

selecting an isolated stem cell obtained from adult bone marrow, which cell is CD117-negative and CD140-positive,

administering thereto a chromosomal DNA-dimethylating agent and

obtaining a cell according to claim 8.

50. (Original) The method according to claim 48 or 49, wherein the chromosomal DNA-dimethylating agent is selected from the group consisting of a demethylase, 5-azacytidine, and DMSO.

51. (Previously Presented) The method according to claim 50, comprising administering a demethylase comprising the amino acid sequence represented by SEQ ID NO:1.

52. (Previously Presented) A method for differentiating a cell into a cardiac muscle comprising

selecting the isolated stem cell according to any one of claims 1, 6-19 or 21-28 and applying thereto a factor which is expressed in a cardiogenesis region of a fetus or a factor which acts on differentiation into a cardiomyocyte in a cardiogenesis stage of a fetus.

53. (Previously Presented) The method according to claim 52, comprising administering at least one factor selected from the group consisting of a

cytokine, an adhesion molecule, a vitamin, a transcription factor, and an extracellular matrix.

54. (Previously Presented) The method according to claim 53, comprising administering at least one cytokine selected from the group consisting of a platelet-derived growth factor, a fibroblast growth factor-8, an endothelin 1, a midkine; and a bone morphogenetic factor-4.

55. (Previously Presented) The method according to claim 54, wherein PDGF, FGF-8, ET1, midkine, and BMP-4 respectively comprise the amino acid sequences represented by SEQ ID NOS:3 or 5, the amino acid sequence represented by SEQ ID NO:64, the amino acid sequence represented by SEQ ID NO:66, the amino acid sequence represented by SEQ ID NO:68, and the amino acid sequence represented by SEQ ID NO:70.

56. (Previously Presented) The method according to claim 53, comprising administering at least one adhesion molecule selected from the group consisting of a gelatin, a laminin, a collagen, and a fibronectin.

57. (Previously Presented) The method according to claim 53, comprising administering retinoic acid.

58. (Previously Presented) The method according to claim 53, comprising administering at least one transcription factor selected from the group consisting of Nkx2.5/Csx, GATA4, MEF-2A, MEF-2B, MEF-2C, MEF-2D, dHAND, eHAND, TEF-1, TEF-3, TEF-5, and MesPl.

59. (Previously Presented) The method according to claim 58, wherein Nkx2.5/Csx, GATA4, MEF-2A, MEF-2B, MEF-2C, MEF-2D, dHAND, eHAND, TEF-1, TEF-3, TEF-5, and MesPl respectively comprise the amino acid sequences represented by SEQ ID NO:9, the amino acid sequence represented by SEQ ID NO:11, the amino acid sequence represented by SEQ ID NO:13, the amino acid sequence represented by SEQ ID NO:15, the amino acid sequence represented by SEQ ID NO:17, the amino acid sequence represented by SEQ ID NO:19, the amino acid sequence represented by SEQ ID NO:21, the amino acid sequence represented by SEQ ID NO:23, the amino acid sequence represented by SEQ ID NO:25, the amino acid sequence represented by SEQ ID NO:27, the amino acid sequence represented by SEQ ID NO:29, the amino acid sequence represented by SEQ ID NO:62.

60. (Previously Presented) The method according to claim 53, comprising administering an extracellular matrix derived from a cardiomyocyte.

61. (Previously Presented) A method for differentiating a cell into an adipocyte comprising selecting the isolated stem cell according to any one of claims 1, 6-19 or 21-28 and applying thereto an activator of nuclear receptor PPAR-γ.

62. (Original) The method according to claim 61, wherein the activator is a compound having a thiazolidione skeleton.

63. (Previously Presented) The method according to claim 62, wherein the thiazolidione compound is at least one selected from the group consisting of troglitazone, pioglitazone, and rosiglitazone.

Claims 64-77 (Canceled)

78. (Previously Presented) A method for specifically transfecting a wild-type gene corresponding to a mutant gene in a congenital genetic disease of a heart comprising selecting the isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, and introducing a wild-type gene corresponding to a mutant gene in the congenital genetic disease.

79. (Previously Presented) A therapeutic agent for a heart disease, comprising, as an active ingredient, the isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44 into which a wild-type gene corresponding to a mutant gene in a congenital genetic disease of a heart has been introduced.

80. (Previously Presented) A method for producing an antibody comprising selecting the isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, using the stem cell as an antigen and obtaining an antibody which specifically recognizes the stem cell.

81. (Previously Presented) A method for isolating an isolated stem cell having the potential to differentiate into a cardiomyocyte according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, comprising using an antibody which specifically recognizes the stem cell.

82. (Previously Presented) A method for obtaining a cell-surface antigen comprising practicing the method according to claim 80, and characterizing the antigen recognized by the antibody that specifically identifies the stem cell.

83. (Previously Presented) A method for screening a proliferative factor, comprising selecting an isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, administering materials to said stem cell and determining proliferation thereof.

84. (Previously Presented) A method for screening a factor, comprising selecting an isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, administering materials to said stem cell and determining cardiomyocytes.

85. (Previously Presented) A method for screening a factor, comprising selecting an isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, administering materials to said stem cell and determining immortalized cells.

86. (Previously Presented) A method for immortalizing a cell, comprising selecting an isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, and expressing a telomerase in the cell.

87. (Original) The method according to claim 86, wherein the telomerase comprises the amino acid sequence represented by SEQ ID NO:31.

88. (Previously Presented) An isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44 which has been immortalized by expressing a telomerase.

89. (Previously Presented) An isolated stem cell according to claim 88, wherein the telomerase comprises the amino acid sequence represented by SEQ ID NO:31.

90. (Previously Presented) A culture supernatant comprising the isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44.

91. (Previously Presented) A method for inducing a first cell to differentiate into a cardiomyocyte, comprising selecting a culture comprising the isolated stem cell according to any one of claims 1, 6-19 or 21-28, 38, 39, 41, 43 or 44, and applying to said first cell a supernatant from said culture.